

National Aeronautics and
Space Administration
Lyndon B. Johnson Space Center
White Sands Test Facility
P.O. Box 20
Las Cruces, NM 88004-0020



November 28, 2012

Reply to Attn of:

RE-12-166

New Mexico Environment Department
Attn: Mr. John Kieling, Chief
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505

Subject: NASA White Sands Test Facility (WSTF) 2012 Waste Minimization Plan

Enclosed is the 2012 Waste Minimization Plan as required by the WSTF Hazardous Waste Permit No. NM8800019434. Enclosure 1 provides a paper copy of the document. Enclosure 2 provides an electronic copy of the document on CD-ROM. This report has been prepared for fiscal year 2012. NASA tracks recycling and related waste activities on a federal fiscal year basis (October 1 to September 30). This approach maintains consistency with previous submittals and ensures a complete and accurate report.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted, to the best of my knowledge and belief, is true, accurate, and complete. I am aware there are significant penalties for submitting false information including the possibility of fine and imprisonment for knowing violations.

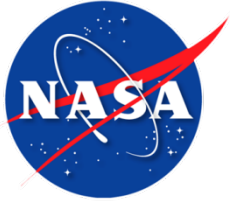
If you have any questions or comments concerning this submittal, please contact Tim Davis of my staff at 575-524-5024.

A handwritten signature in black ink, appearing to read "RBF", with a large "10" written next to it.

Radel Bunker-Farrar
Chief, Environmental Office

2 Enclosures

cc: (with enclosures)
Mr. Dan Comeau
New Mexico Environment Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505



National Aeronautics and
Space Administration

Hazardous and Solid Waste Amendments (HSWA) Waste Minimization Plan

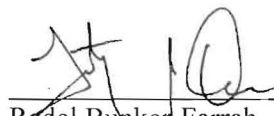
October 1, 2011 to September 30, 2012

NM8800019434
NASA Johnson Space Center White Sands Test Facility
12600 NASA Road Las Cruces, New Mexico 88012

NASA Johnson Space Center White Sands Test Facility
Hazardous and Solid Waste Amendments (HSWA)
Waste Minimization Plan

October 1, 2011 to September 30, 2012

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



Radel Bunker-Farrar
Chief, NASA Environmental Office

11/28/12
Date

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List of Acronyms and Abbreviations

EMP	Environmental Management Plan
EMS	ISO 14001 Environmental Management System
EO	Executive Order
EPA	United States Environmental Protection Agency
FY	Fiscal year
ISO	International Organization for Standardization
NASA	National Aeronautics and Space Administration
NETS	NASA Environmental Tracking System
NMED	New Mexico Environment Department
NPR	NASA procedural requirement
MPITS	Mid-plume Interception and Treatment System
MSDS	Material safety data sheet
MW	Megawatt
OFEE	Office of the Federal Environmental Executive
P2	Pollution prevention
PFTS	Plume Front Treatment System
POTW	Publicly owned treatment works
RSA	Recycling and sustainable acquisition
SSPP	Strategic Sustainability Performance Plan
WSIT	WSTF Sustainability Initiative Team
WSTF	NASA Johnson Space Center White Sands Test Facility

1.0 Introduction

The New Mexico Environment Department (NMED) Hazardous Waste Permit (Permit), issued to the National Aeronautics and Space Administration (NASA) Johnson Space Center White Sands Test Facility (WSTF) became effective December 9, 2009. The Permit requires that WSTF institute a waste minimization program to reduce the volume and toxicity of hazardous wastes generated by the facility's operation, to the degree determined by NASA to be economically practicable.

2.0 Objectives and Scope

The Permit requires that WSTF submit a copy of the annual certified statement regarding the waste minimization program to NMED by December 1st for the previous 12-month period ending September 30. The reporting period included in this document is October 1, 2011 through September 30, 2012, or NASA fiscal year (FY) 2012.

The WSTF source reduction, recycling, and planning activities for this reporting period are addressed below. The Permit requirements are listed below with a response following each requirement.

3.0 Waste Minimization Program Plan Components (Permit-specified)

3.1 Policies and Programs

The Permit specifies inclusion of the following in the Waste Minimization Program Plan: *Any written policy or statement that outlines goals, objectives, and methods for source reduction and recycling of hazardous waste at the Facility.* This section includes descriptions of existing policies and ongoing programs that support waste minimization at WSTF.

3.1.1 Environmental Management System

NASA incorporated the ISO 14001:2004 Environmental Management System (EMS) into the WSTF Management Policy. This action emphasizes NASA's commitment to reducing the consumption of natural resources while exhibiting environmental stewardship related to all site activities and procedures.

WSTF uses EMS procedures to evaluate the environmental aspects of site activities, products, and services to determine their environmental impacts. Environmental impacts of each aspect are ranked and those with significant impacts are established as "significant aspects." An Environmental Management Plan (EMP) is established for each significant aspect. Each EMP will outline objectives and targets developed to lessen the environmental impact and reduce the consumption of natural resources at WSTF. Objectives and targets are to be met by completing tasks that may be directed toward regulatory compliance, pollution prevention, reduction in waste generation, increase in waste diversion, and resource conservation (materials, energy, water, and fuel).

The FY2012 significant aspects and associated EMPs were:

- Energy Efficiency and Water Conservation.
- Groundwater Contamination.
- Hazardous Materials Management.
- Sustainable Acquisition.
- Environmental Sustainability.

Objectives and accomplishments for each EMP are discussed below.

Energy Efficiency and Water Conservation

The objective of this EMP is to reduce site energy and water use according to federal requirements. The site Energy Manager reported the following accomplishments during FY2012:

- An agreement was formed with the National Renewable Energy Laboratory to conduct studies for potential renewable energy and energy efficient projects at WSTF.
- Electric and natural gas meters were installed in 13 buildings.
- Energy-saving light fixtures were installed in one building.
- Water conservation efforts are ongoing; including the installation of water-saving fixtures as facility restrooms are upgraded.
- Completed the Energy Monitoring and Control System scheduling report.

Groundwater Contamination

Two groundwater contamination remediation systems are in operation at WSTF. The objective of the Plume Front Treatment System (PFTS) is to control further migration of contaminated groundwater at the plume-front. The objective of the MPITS is to intercept highly contaminated groundwater flowing through the Mid-plume constriction area toward the plume front.

- Discharge Permit (DP) 1255 was issued by NMED on September 26, 2011.
- The Mid-plume Interception and Treatment System (MPITS) began continuous operation during the first quarter of FY2012.
- Both groundwater contamination remediation systems are operating in compliance with DP-1255 and the NMED Hazardous Waste Operating Permit.

Hazardous Materials Management

- Version 8 of the Material Safety Data Sheet (MSDS) Online (MSDSonline[®]1) continues to be used as an interactive tool to track chemical inventories accessible by all site personnel.

Sustainable Acquisition

The objective for the FY2012 Sustainable Acquisition EMP was to develop a procedure for sustainable acquisition (buying green products/materials) at WSTF. Targets involved establishing a committee of stakeholders, finalize the draft guidance document, and present recommendations to management. The stakeholder committee that was established includes contractor purchasing, environmental, warehouse personnel, and a NASA Environmental representative. Once the NASA procedural requirement (NPR) for Sustainable Acquisition has been finalized, the equivalent WSTF document will be aligned with the NPR, presented to management, and finalized.

As a federal agency, NASA is required to reduce resource use by procuring products and services that have a lesser or reduced adverse effect on the environment when compared to competing products or services. This includes products that are made of recovered, recycled, biobased, renewable, non-ozone-

¹ MSDSonline[®] is a registered trademark of Kelleher, Helmrich, & Associates, Inc.

depleting, or other environmentally preferable materials, or are energy efficient or water conserving. Procedures are being developed that will continually increase the volume of green products purchased by the site. The following list includes procedures established to continually improve sustainable acquisition at WSTF:

- WSTF environmental personnel review contractor purchase requests to ensure compliance with federal requirements.
- Stakeholders meet bi-weekly to address issues and refine the “buy green” process.
- Site-wide “buy green” training of personnel has been implemented and is underway.

Environmental Sustainability

This EMP is managed by the WSTF Sustainability Initiative Team (WSIT). FY2012 objectives focused on raising employee awareness and encouraging employees to participate in WSTF’s continued evolution toward sustainability. WSIT activities during FY2012 included:

- Continuing a site-wide sustainability awareness program via site newsletters and emails, a SharePoint website, and annual events.
- Supporting sustainable acquisition.
- Documenting WSTF sustainable actions and initiatives to show continual improvement.
- Implementing single-stream recycling at WSTF.

Every three years, NASA conducts an Environmental Functional Review Audit at each NASA center. WSTF underwent this audit during FY2012. The ISO 14000 external audit was also conducted during FY2012. WSTF received high scores in both audits.

3.1.2 Sustainability at WSTF

WSTF management recognized that the depletion of natural resources threatened to significantly impact the environment at WSTF. As a result, Sustainability was established as an EMS significant aspect and the WSTF Sustainability Initiative Team (WSIT) was established in FY2005. NASA continues to support WSIT’s efforts, including management of the sustainability EMP, via task order funding. WSIT evaluates and advises management in areas of environmental stewardship and sustainability, represents the WSTF community’s environmental conscience, gathers and disseminates information on the various aspects of sustainability, advocates for employees’ ideas, documents site sustainable actions, and provides a mechanism for implementing change.

Many WSTF programs that existed prior to 2005 fall under the umbrella of sustainability. Ongoing programs including Pollution Prevention (P2), Waste Management, and Recycling are administered by the WSTF Environmental Department in accordance with federal laws, executive orders, and NASA procedural requirements. Measures to reduce hazardous waste, minimize the use of toxic substances, reduce resource use, and improve environmental performance at WSTF have been successful and WSTF continues to evolve toward environmental sustainability.

With the 2009 promulgation of Executive Order (EO) 13514 “Federal Leadership in Environmental, Energy, and Economic Performance,” each federal agency was required to prepare and implement a Strategic Sustainability Performance Plan (SSPP). NASA submitted the initial plan to the Office of Management and Budget in the summer of 2010. NASA adopted the sustainability goals set forth for federal agencies in the EO, reporting progress in the annual updates. NASA submitted the 2012 SSPP in

June 2012. SSPP goals include greenhouse gas reduction, high performance sustainable buildings and renovations, sustainable acquisition, water use efficiency and management, pollution prevention and waste reduction (including recycling), and electronics stewardship. WSIT provides support to WSTF stakeholders that are working toward the SSPP goals.

Continual waste stream review and characterization activities, established in the 2009 NMED Hazardous Waste Permit, have promoted a closer look at waste generation and minimization at WSTF. Hazardous waste generation process modifications, improved waste determinations, and generator attention to waste stream constituents and concentrations continue to reduce waste.

The WSTF Environmental Department maintains records of sustainable actions in the areas of hazardous and solid waste minimization, recycling, resource conservation, and environmental stewardship. Fiscal year data are entered into the NASA Environmental Tracking System (NETS). NETS information is gathered for required NASA-wide reporting in the annual SSPP. NETS reporting information continues to be used on-site for tracking waste and minimization projects.

3.2 Training and Incentive Programs

The Permit specifies inclusion of the following in the Waste Minimization Program Plan: *Any employee training or incentive programs designed to identify and implement source reduction and recycling opportunities.*

EMS awareness training is included in the environmental briefing section of the new hire orientation. The material emphasizes sustainability, pollution prevention, continuous improvement, and compliance with environmental laws. “Environmental Compliance Awareness” training serves as a refresher for waste minimization and other environmental programs.

WSIT continues a sitewide awareness campaign to strengthen the sustainability culture at the site. WSIT provides information through various forms of communication, such as WSIT NewsFlash emails, the WSIT SharePoint website, sustainability presentations, and posting articles in the two WSTF newsletters; the bi-weekly “Porcelain Press” and the monthly “What’s Going On at WSTF.” WSIT annually celebrates America Recycles Day (November 15th) and Earth Day (April 22nd) with site-wide awareness events.

“Buy green” training specific to the WSTF procurement systems has been developed and incorporated into the annual refresher training for all employees that order goods and services for the site. Trainings are held on a monthly basis.

In addition to formal training sessions, WSTF management personally emphasizes the site objective of achieving environmental excellence and increasing awareness via frequent employee all-hands meetings. Topics such as environmental awareness, process reminders, site accomplishments, program visibility, and individual recognitions are shared using the site newsletter and posted bulletins.

3.3 Source Reduction and Recycling Measures

The Permit specifies inclusion of the following in the Waste Minimization Program Plan: *Any source reduction and/or recycling measures implemented in the last five years or planned for the near future.*

WSTF continues to carry out a phased approach to sustainable acquisition; greening the warehouse one category at a time. NASA follows the federal green product requirements listed on the Green Products Compilation at <http://www.sftool.gov/greenprocurement?CFID=93864&CFTOKEN=27375560>. This site lists 19 product categories and specifies biobased, energy saving, water conserving, and

recycled/recovered content requirements for hundreds of products. Due to the impracticality and inefficiency of greening the thousands of warehouse stock items (items with green requirements) all at once, NASA elected to focus on the replacement of toxic cleaning products with cleaning products that contain biobased materials during FY2012. Specific source reduction and recycling measures for the current reporting period and future plans are presented in [Appendix A](#).

3.4 Operating Costs

The Permit specifies inclusion of the following in the Waste Minimization Program Plan: *An itemized list of the dollar amounts of capital expenditures (plant and equipment) and operating costs devoted to source reduction and recycling of hazardous waste.*

Capital expenditures and operating costs associated with source reduction and recycling are not specifically tracked; however, activities initiated or continuing during the reporting period reflect significant investments and cost avoidances. For example, as part of the WSTF property management process, almost 15 tons 14,490 kg (31,946 lb.) of electronic equipment (E-waste) and 930 kg (2050 lb) of scrap metal were recycled in FY 2012. A large-scale cleanup project yielded 10,756 tons of recycled construction/demolition materials, including concrete, scrap metal and wood.

NASA also continued funding of WSIT. For FY 2012, the WSIT allocated budget was \$63,000. Community partnerships established over the last several years have enabled WSTF to continually increase the types and volume of (non-hazardous) recyclable materials at minimal cost. The recycling of non-hazardous materials has evolved from a grassroots effort and the success of the program is due to the voluntary participation of WSTF employees.

3.5 Limiting Factors

The Permit specifies inclusion of the following in the Waste Minimization Program Plan: *Factors that have prevented implementation of source reduction and/or recycling.*

NASA tests and evaluates spacecraft materials, components, and propulsion systems to enable the safe exploration and utilization of space. NASA test programs are dependent upon federal funding and many projects are funded on a program-by-program basis. One-time, short-term, and inconsistent testing schedules generate dynamic and variable waste streams that are difficult to manage for source reduction and recycling. Customer/test requirements, military specifications, original equipment manufacturer specifications, and program timelines limit the use and feasibility of recycling test materials. During this period, WSTF provided support for space shuttle retirement efforts. Future NASA programs, National Defense System rocket engine testing, missile demilitarization, and decommissioning and decontamination of antiquated aerospace equipment will increase customer testing requirements and limit the feasibility of source reduction.

3.6 Information Sources

The Permit specifies inclusion of the following in the Waste Minimization Program Plan: *Sources of information on source reduction and/or recycling received at the facility (e.g., local government, trade associations, suppliers, etc.).*

The NASA Principal Center for Regulatory Risk Analysis and Communication reviews the federal register and issues emails with specific information pertaining to changing regulations. The reviews often necessitate white papers and regulatory reviews to evaluate impacts to WSTF operations.

WSIT personnel also participate in the NASA Recycling and Sustainable Acquisition (RSA) workshops, video conferences, and WebEx presentations sponsored by the NASA RSA Principal Center. These venues facilitate the sharing of information about recycling, sustainability, and pollution prevention strategies between NASA centers. During this reporting period, WSIT members attended speaker meetings sponsored by the Las Cruces Green Chamber of Commerce. One or more WSIT representatives attended the biennial New Mexico Recycling Conference in June and the New Mexico Water Resources Research Institute 57th Annual New Mexico Water Conference in August. WSTF personnel also utilize online resources which continuously offer information related to source reduction and recycling. Source agencies include the NMED, the United States Environmental Protection Agency (EPA), Office of the Federal Environmental Executive (OFEE), the United States Department of Agriculture, the General Services Administration, NASA, and others.

3.7 Additional Waste Minimization Efforts

The Permit specifies inclusion of the following in the Waste Minimization Program Plan: *An investigation of additional waste minimization efforts which could be implemented at the facility. This investigation shall analyze the potential for reducing the quantity and toxicity of each waste stream through production reformulation, recycling, and all other appropriate means. The analysis shall include an assessment of the technical feasibility, cost, and potential waste reduction for each option.*

WSTF procedures require periodic review of all WSTF waste streams. This evaluation includes generation process changes, contaminant concentrations, quantity variations, waste determinations, and potential changes to minimize waste generation. Budget constraints paired with sustainable thinking have spurred creative and economic solutions for waste minimization.

The WSTF operational organizations continuously research equipment replacement, product replacement, and product conservation efforts. For example, the Propulsion Test Department is designing a distillation unit that will reduce non-volatile residue in its fuel conditioning process and maintain product integrity for reuse. The Component Services Department is working with an off-site contractor for rinse water reclamation and routing of the reject water from the reverse osmosis generation units to cooling towers or other operations. Rinse water from the gross cleaning process will also be recycled back into the de-ionization loop.

3.8 Hazardous Waste Matrix

The Permit specifies inclusion of the following in the Waste Minimization Program Plan: *The Permittee shall submit a flow chart or matrix detailing all hazardous wastes it produces by quantity, type, and building/area.*

The Hazardous Waste Matrix ([Appendix B](#)) identifies the WSTF hazardous waste streams by number, waste name, generation building, area, and the generator's annual estimated quantity.

3.9 Limitations to Waste Reduction

The Permit specifies inclusion of the following in the Waste Minimization Program Plan: *The Permittee shall demonstrate the need to use those processes which produce a particular hazardous waste due to a lack of alternative processes or available technology that would produce less hazardous waste.*

Testing at WSTF supports the federal aerospace industry. The wastes generated in association with this testing are derived from the following processes: engine firings; developmental research; equipment cleaning/repair; missile demilitarization; aerospace equipment decommissioning and decontamination;

facility construction/maintenance; and computer and electrical support. These wastes are often dependent upon contractor test requirements, military specifications, program timelines, and additional conditions mandated by contracts.

Appendix A
Source Reduction and Recycling Tables

Table A-1 WSTF Hazardous Waste Source Reduction (Oct. 1, 2011 – Sept. 30, 2012)		
YEAR	SOURCE REDUCTION EFFORT	NET REDUCTION
2004 and beyond	Sixty groundwater wells continue to utilize dedicated low-flow sampling equipment that was approved by NMED. The technology allows continued use of current well structures, avoids drilling new wells, and minimizes generation of purge water (hazardous waste identified as investigation-derived waste).	324,000 gals (36,000 gal per year)
2009 and beyond	Electronics recycling (including toner cartridges) initiated through UNICOR.	14,490 kg (31,946 lb) recycled in FY 2012; 201,954 lb since 2009
2010 and beyond	Contamination control continued emptying cleaning tanks with corrosive solutions (Oakites) on a yearly schedule, rather than weekly (as previously done), with tank recharge as needed.	360 gal
2010 and beyond	Molecular Desorption Analysis Lab (MDAL) replaced organic solvents with HFE 7100 for the cleaning of collector plate used in Volatile Condensable Materials process.	3 to 5 gallons of hazardous waste organics (spent toluene, chloroform, ethanol) annually. Also 80 to 90% of the HFE 7100 goes to Component Services for cleanup and reuse.
2011 and beyond	Working to meet federal requirements for sustainable acquisition. Requirements include replacing ozone depleting substances with approved substitutes listed in the significant new alternatives policy: http://www.epa.gov/ozone/snap/lists/index.html	
2012	Component services transferred citric acid to Environmental Department. Material is being used to clean out scrubbers in Plume Front Treatment System.	113 kg (250 lb)

Table A-2 WSTF Hazardous Waste Recycling (Oct. 1, 2011 – Sept. 30, 2012)		
FISCAL YEAR	HAZARDOUS WASTE RECYCLED	NET REDUCTION
2012	Nickel-cadmium batteries were collected and shipped off-site for recycling as universal waste rather than hazardous waste.	82 kg (181 lb)
2012	Lithium batteries were collected and shipped off-site for recycling as universal waste rather than hazardous waste.	35 kg (77 lb)
2012	Lead acid batteries were collected and shipped off-site for recycle as universal waste rather than hazardous waste.	1793 kg (3953 lb)
2012	Spent Dry Cell Batteries (Alkaline) batteries are collected and shipped off-site for recycling as solid waste rather than hazardous or universal waste	129 kg (284 lb)
2012	The Facilities Maintenance Group collects mercury containing lamps which are recycled as universal waste.	689 kg (1539 lb)
2012	Scrap metal was collected and shipped off site for recycle as scrap metal rather than hazardous waste	930 kg (2050 lb)
2012	Shuttle fuel cells recycling enabled the recovery of precious metals.	69 kg (152 lb)

Table A-3 WSTF Hazardous Waste Source Reduction/Recycling Future Plans

TIME FRAME	PLANNED SOURCE REDUCTION/RECYCLING	NET REDUCTION
In progress	NASA personnel have chosen the technology and are in the process of design review and procurement of equipment for a distillation system that has the capability of maintaining propellants within the parameters required by NASA customer-driven specifications. The system will avoid the high cost of new propellant and monies required for labor, dilution, and disposal of potential hazardous waste.	TBD
Ongoing	NASA continues to be an integral support system for the space effort. WSTF support is critical in NASA's ability to test engines at simulated altitudes. The Propulsion Test Office will continue to test systems that use methanol, LOX, and other propellants instead of hydrazine(s) and nitrogen tetroxide in an effort to reduce the generation of highly toxic hazardous wastes.	TBD
Ongoing	The NASA Plume Front Treatment System continues to treat groundwater contaminated with TCE, PCE, Freon-113, Freon-11, and N-nitrosodimethylamine.	> 99.9 %
Ongoing	The NASA Mid-Plume Groundwater Remediation System continues to treat groundwater contaminated with Freon-113, TCE, PCE, Freon-11, and N-nitrosodimethylamine.	> 99.9 %
In progress	Studies and initiatives for alternatives for the supply of electricity to run the NASA WSTF Groundwater Remediation Systems continue to be evaluated. The alternatives include wind, solar, and fuel cells.	TBD
In progress	The Chemistry Laboratory and Environmental Departments continue to investigate requirements and processes that involve waste minimization/elimination of the scrubber fluids from fume hoods in the labs.	TBD
In progress	NASA continues to evaluate the potential for additional precious metal recovery that will recover gold, platinum and palladium from Space Shuttle fuel cells.	TBD
In progress	Connecting with the City of Las Cruces Publicly Owned Treatment Works will enable NASA to significantly reduce waste, avoid sewage lagoon use, and allow elimination of the 200 Area Evaporation Tank Unit.	TBD

Appendix B
Hazardous Waste Matrix

**Table B-1 FY2011 WSTF Hazardous Waste Generation Matrix
Off-Site Recycling and Treatment in FY2012**

Waste	Weight
Nickel cadmium batteries (cadmium D006) were recycled as universal waste – off-site. Stored in 150 drum storage facility (prior to shipment).	82 kg (181 lb)
Lead acid batteries were recycled as universal waste – off-site. Stored in 150 drum storage facility (prior to shipment). Additionally, lead acid batteries are recycled by core exchange when new batteries are delivered by the vendor.	1,793 kg (3,953 lb)
Lithium batteries (D003) deactivated as universal waste - off-site. Stored in 150 drum storage facility (prior to shipment).	35 kg (77 lb)
Silver oxide batteries (D011) recycled as universal waste – off-site. Stored in 150 drum storage facility (prior to shipment).	1 kg (2 lb)
Mercury batteries (D009) recycled as universal waste – off-site. Stored in 150 drum storage facility (prior to shipment).	1 kg (2 lb)
Spent dry cell (alkaline) batteries (non dot regulated) recycled as solid waste – off-site. Stored in 150 drum storage facility (prior to shipment).	129 kg (284 lb)
Scrap metal (non-DOT-regulated) recycled as scrap metal – off-site. Stored in building 159 WSTF recycling center (prior to shipment).	932 kg (2,055 lb)

Table B-2 WSTF Hazardous Waste Generation Matrix Off-Site Treatment				
CURRENT WIWPS	WASTE NAME	BUILDING	GENERATING AREA	ANNUAL QUANTITY
MERCURY/MERCURY CONTAMINATED REFUSE (D009) STABILIZED OFF-SITE BY CLEAN HARBORS STORED IN 90-DAY STORAGE UNIT (PRIOR TO SHIPMENT) –WSTF shipped 12 kg (106 lb) in FY 2012				
102011118	Broken Fluorescent Lamp	121	M & O	1 kg (2 lb)
10201221	Mercury Contaminated Debris	121	M & O	8 kg (18 lb)
10201237	Mercury Contaminated Debris	121	M & O	3 kg (7 lb)
X-RAY FILM AND FIXER SOLUTION (SILVER D0011) INCINERATED OFF-SITE BY CLEAN HARBORS, STORED IN 90-DAY STORAGE UNIT (PRIOR TO SHIPMENT) – WSTF shipped 48 kg in FY 2012				
20-02-14	Waste X-Ray Fixer Solution	203	Met Lab	5 gals/22 kg (49 lb)
10201280	Off Spec Material	100	Warehouse	26 kg (57 lb)
WASTE PAINT AND ADHESIVE (D001, D002, D003, D005, D006, D007, D008, D009, D018, D035, D039, D040, F002 F003) INCINERATED OFF-SITE BY CLEAN HARBORS STORED IN 90-DAY STORAGE UNIT (PRIOR TO SHIPMENT) STORED IN 90-DAY STORAGE UNIT (PRIOR TO SHIPMENT) – WSTF shipped 801 kg (1,766 lb) off-site in FY 2012.				
10-03-01	Paints Pourable/Solvent	Site	Facilities Construction/Maintenance/Site	118 kg (260 lb)
10-03-06	Off-spec Paints	Site	Facilities Construction/Maintenance/Site	56 kg (123 lb)
10-03-08	Waste Paint Related Materials	Site	Facilities Construction/Maintenance/Site	118 kg (260 lb)
10-03-07	Contaminated Debris (brushes/rollers)	Site	Facilities Construction/Maintenance/Site	44 kg (97 lb)
10-20-43	Waste Aerosol Cans	site	Environmental Department	84 kg (185 lb)

Table B-2 WSTF Hazardous Waste Generation Matrix Off-Site Treatment				
CURRENT WIWPS	WASTE NAME	BUILDING	GENERATING AREA	ANNUAL QUANTITY
10201246	Henry 201 Asphalt Roof Coating	150	Facilities Construction/Maintenance/Site	156 kg (344 lb)
10201247	Gardner Fibered Roof Coating	150	Facilities Construction/Maintenance/Site	53 kg (117 lb)
10201248	Pervo Paint	150	Facilities Construction/Maintenance/Site	19 kg (42 lb)
10201231	Off Spec Products	634	Facilities Construction/Maintenance/Site	35 kg (77 lb)
10-03-01	Paints Pourable/Solvent	Site	Facilities Construction/Maintenance/Site	118 kg (260 lb)
*CONTAMINATED OILS - VACUUM PUMP, REFRIGERATION, SLUDGE, AND MACHINE SHOP, (F001, F002, F003, F005, D002, D004, D005, D006, D007, D008, D009, D018, D035) INCINERATED OFF-SITE BY CLEAN HARBORS, STORED IN 90-DAY STORAGE UNIT (PRIOR TO SHIPMENT) – WSTF shipped 481 kg (1,060 lb) of Contaminated Soil, Sludge, and Spill Dry with Oil/Diesel in FY 2012.				
10-06-11	Contaminated Spill Dry	200	Mechanical Room	92 kg (203 lb)
10-10-09	Contaminated Spill Dry	151	GSA Garage	14 kg (31 lb)
102011133	Contaminated Soil	113	Fuel Pumps	2 kg (4 lb)
10201202	Gasoline Contaminated Debris	100	100 Area Fueling Station	45 kg (99 lb)
10201212	Contaminated Soil	100	Fuel Pumps	15 kg (33 lb)
10201214	Contaminated Soil	100	Fuel Pumps	6 kg (13 lb)
10201254	Contaminated Soil	156	Heavy Equipment	20 kg (44 lb)
10201259	Contaminated Soil	156	Heavy Equipment	10 kg (22 lb)
20-01-42	Blast Media	200	CSS	22 kg (49 lb)
27201201	Oil Contaminated Soil	272	Hypervelocity	25 kg (55 lb)
30201201	Contaminated Soil	300	Apollo Blvd south of 300 Area	60 kg (132 lb)

Table B-2 WSTF Hazardous Waste Generation Matrix Off-Site Treatment				
CURRENT WIWPS	WASTE NAME	BUILDING	GENERATING AREA	ANNUAL QUANTITY
40201201	Petroleum Contaminated Spill Dry	400	Propulsion Test (Steam)	100 kg (220 lb)
40201203	Hydraulic Oil Contaminated Spill Dry	400	Propulsion Test (Steam)	69 kg (152 lb)
60201211	Contaminated Spill Dry	650	Plume Front Treatment Bldg. (Environmental)	1 kg (2 lb)
CONTAMINATED (FUEL) MATERIALS (P068, U098, U099, U133) INCINERATED OFF-SITE BY CLEAN HARBORS STORED IN 90-DAY STORAGE UNIT (PRIOR TO SHIPMENT) – WSTF shipped 426 kg (939 lb) of hydrazine(s) contaminated debris/materials in FY 2012.				
20-01-25	Fuel Contaminated Debris	200	Clean Room	5 kg (11 lb)
20-04-18	Fuel Contaminated Debris	200	Chemistry Lab	45 kg (99 lb)
20-01-25	Fuel Contaminated Debris	200	Clean Room	30 kg (66 lb)
20-04-03	Fuel Contaminated Pickle jars	200	Chemistry Lab	20 kg (44 lb)
20-04-18	Fuel Contaminated Debris	200	Chemistry Lab	40 kg (88 lb)
20-04-31	Fuel Contaminated Material	200	Chemistry Lab	5 kg (11 lb)
20-04-63	Fuel Contaminated Material	200	Chemistry Lab	3 kg (7 lb)
20-04-108	Dilute Fuel Cont. Sample Vials	200	Chemistry Lab	3 kg (7 lb)
30-01-08	Fuel Contaminated Soft Goods	301	Propulsion Test (300 Area)	1 kg (2 lb)
40-01-08	Fuel Contaminated Debris	412	Propulsion Test (400 Area)	95 kg (209 lb)
50-20-01	Fuel Contaminated Debris	500	Fuel Treatment Unit	55 kg (121 lb)
50-20-04	GAC with Hydrazine	500	Fuel Treatment Unit	124 kg (273 lb)

Table B-2 WSTF Hazardous Waste Generation Matrix Off-Site Treatment				
CURRENT WIWPS	WASTE NAME	BUILDING	GENERATING AREA	ANNUAL QUANTITY
CONTAMINATED (OXIDIZER) MATERIALS (P078,ORIGINALLY BUT HAVE BEEN ADGASSED, F001, F002, P068, U098, U133) INCINERATED OFF-SITE BY CLEAN HARBORS STORED IN 90-DAY STORAGE UNIT (PRIOR TO SHIPMENT) - WSTF shipped 87 kg (192 lb) of oxidizer contaminated soft goods in FY 2012.				
20-01-24	Oxidizer Contaminated Debris	200	Clean Room	34 kg (75 lb)
20-04-16	Oxidizer Contaminated Debris	200	Chemistry Lab	43 kg (95 lb)
20-04-56	Ox Drager Pac III Sensors	200	Chemistry Lab	5 kg (11 lb)
30-01-30	Oxidizer Contaminated Soft Goods	301	Propulsion Test (300 Area)	2 kg (4 lb)
80-02-08	Oxidizer Contaminated Soft Goods	800	Hazardous Fluids Test	3 kg (7 lb)
CONTAMINATED DEBRIS (F001, F002, F003, F004, F005, D004, D005, D006, D007, D008, D011, D018, D022, D035, D040) INCINERATED OFF-SITE BY CLEAN HARBORS, STORED IN 90-DAY STORAGE UNIT (PRIOR TO SHIPMENT)–WSTF shipped 3,769 kg (8,309 lb) of Contaminated Debris in FY 2012				
10-01-18	Contaminated Rags (Debris)	156	Facilities Heavy Equipment	176 kg (388 lb)
10-01-22	Spent Fuel Filters	159	Facilities Heavy Equipment	43 kg (95 lb)
10-02-09	Contaminated Debris	113	Facilities Machine Shop	609 kg (1343 lb)
10-03-04	Contaminated Debris (Rags)	158	Paint Shop	65 kg (143 lb)
10-04-14	Contaminated Rags (Debris)	121	Facilities Maintenance	43 kg (95 lb)
10-06-12	Contaminated Refuse	121	Mechanical Room	25 kg (55 lb)
10-10-11	Contaminated Debris (Oily Rags)	151	GSA Garage	34 kg (75 lb)
10201205	Lead Contaminated Debris	200	Labs	1,044 kg (2,302 lb)
20-01-60	Contaminated Debris/Filter Cartridges	200	Clean Room	41 kg (90 lb)
20-02-22	Contaminated Debris	203	Metallurgy Lab	24 kg (53 lb)
20-02-42	Metallographic Consumables	203	Metallurgy Lab	14 kg (31 lb)

Table B-2 WSTF Hazardous Waste Generation Matrix Off-Site Treatment				
CURRENT WIWPS	WASTE NAME	BUILDING	GENERATING AREA	ANNUAL QUANTITY
20-02-46	Metallographic Consumables	203	Metallurgy Lab	14 kg (31 lb)
20-04-31	Waste Firebrick Material	200	Chemistry Lab	3 kg (7 lb)
20-04-40	Contaminated Refuse	200	Chemistry Lab	14 kg (31 lb)
20-06-09	Contaminated Debris	203	Chamber Lab	3 kg (7 lb)
20-07-06	Contaminated Debris/Rags	200	Valve Shop	10 kg (22 lb)
27-01-23	Contaminated Debris	272	Hypervelocity	283 kg (624 lb)
30-02-22	Contaminated Rags/Wipes	320	Propulsion Test (300 Area)	140 kg (309 lb)
35-01-39	Contaminated Debris	200	Component Test Facility	17 kg (37 lb)
40-02-26	Contaminated Debris	400	Propulsion Test (Steam)	54 kg (119 lb)
40201209	Contaminated Debris	400	Test Stand 403 Flume	102 kg (225 lb)
60-01-02	IDW Contaminated Deris	600	Sampling Wells (Sitewide)	86 kg (190 lb)
60-04-05	IDW Contaminated Debirs	600	Mid Plume	10 kg (22 lb)
60-04-07	MPITS IDW Contaminated Filters	600	650 Plume Front	103 kg (227 lb)
60201123	Oil Spill Clean Up	600	600 Closure	678 kg (1495 lb)
70201101	SCOG Testing Waste	700	HFTA	93 kg (205 lb)
80-02-74	Oily Contaminated Rags and Spill Dry	802	Hazardous Pressure Test Area (Shop)	12 kg (26 lb)
80-04-09	Contaminated Debris	803	Prep Lab	17 kg (37 lb)
80201110	Contaminated Debris	800	HFTA	7 kg (15 lb)
80201115	Contaminated Debris E-Waste	800	HFTA	5 kg (11 lb)

Table B-2 WSTF Hazardous Waste Generation Matrix Off-Site Treatment				
CURRENT WIWPS	WASTE NAME	BUILDING	GENERATING AREA	ANNUAL QUANTITY
ORGANIC SOLVENTS, CLEANERS, THINNERS (D001, D006, D008, D018, D021, D022 D035, D039, D040, F001, F002 F003, F004, F005, U154, U228, P098) INCINERATED OFF SITE BY CLEAN HARBORS STORED IN 90-DAY STORAGE UNIT (PRIOR TO SHIPMENT) STORED IN 90-DAY STORAGE UNIT (PRIOR TO SHIPMENT) – WSTF shipped 548 kg (1,208 lb) of Organic Solvents in FY 2012.				
10-01-05	Spent Solvents	156	Heavy Equipment	1 kg (2 lb)
10-01-07	Waste Fuels (Gasoline/Diesel)	156	Heavy Equipment	102 kg (225 lb)
10201226	Spent Parts Cleaner	100	M & O	57 kg (126 lb)
10201232	Off-Spec Products	100	M & O	16 kg (35 lb)
10201241	Off-Spec Products	100	Communications	21 kg (46 lb)
10201293	Off-Spec Standards	200	Chemistry Lab	1 kg (2 lb)
20-02-05	Waste Organic Solvents	203	Metallurgy Lab	5 kg (11 lb)
20-04-02	Potassium Cyanide Bearing Waste	200	Chemistry Lab	8 kg (18 lb)
20-04-04	Waste Organic Liquids	200	Chemistry Lab	1 kg (2 lb)
20-04-33	Coulometric Titration Waste	200	Chemistry Lab	1 kg (2 lb)
20-04-53	Toluene/IPA	200	Chemistry Lab	1 kg (2 lb)
20-04-55	Benzene/Aniline Analysis Waste	200	Chemistry Lab	1 kg (2 lb)
20-04-100	E-85 Fuel Analysis Waste	200	Chemistry Lab	1 kg (2 lb)
27-01-33	Spent HNS with Acetone	200	Hypervelocity	5 kg (11 lb)
30-02-18	Waste Lexasol	300	Propulsion Test (Test Stand 303)	327 kg (721 lb)
40-02-08	Waste IPA	400	Propulsion Test (Steam)	1 kg (2 lb)
80-04-03	Waste Organic Standards	800	Materials Test	0.1 kg (0.2 lb)

Table B-2 WSTF Hazardous Waste Generation Matrix Off-Site Treatment				
CURRENT WIWPS	WASTE NAME	BUILDING	GENERATING AREA	ANNUAL QUANTITY
WASTE FUEL (P068, U098, U133) INCINERATED OFF-SITE BY CLEAN HARBORS, STORED IN FUEL TREATMENT UNIT AT <10% –WSTF shipped 24,920 kg (54,939 lb; 6,544) gallons of water with hydrazines from the FTU in FY 2012.				
50201202	Water with <2% Hydrazine	500	Fuel Treatment Unit (FTU)	9,960 kg (21,958 lb)
50201206	Water with <2% Hydrazine	500	Fuel Treatment Unit (FTU)	14,960 kg (32,981 lb)
CORROSIVES (D002) INCINERATED OFF-SITE BY CLEAN HARBORS, STORED IN 90-DAY STORAGE UNIT (PRIOR TO SHIPMENT) –WSTF shipped 1,405 kg (3,097 lb) of Corrosives in FY 2012				
20-01-11	Spent Oakite 126	200	Clean Room	621 kg (1,369 lb)
20-01-13	Spent Oakite Rustripper	200	Clean Room	172 kg (379 lb)
20-01-41	Waste Acid Matrix	200	Clean Room	1 kg (2 lb)
20-01-44	Spent Oakite Deoxidizer SS Solution	200	Clean Room	58 kg (128 lb)
20-01-50	Spent Oakite 31	200	Clean Room	351 kg (774 lb)
20201233	Off Spec Standards	200	Chemistry Lab	5 kg (11 lb)
30201107	Off-Spec Dearborn 152	300	Building 315	197 kg (434 lb)
METAL BEARING WASTES (D002, D004, D005, D006, D007, D008, D009, D010, D011) OFF-SITE BY CLEAN HARBORS STORED IN 90-DAY STORAGE UNIT (PRIOR TO SHIPMENT) – WSTF shipped 407 kg (897 lb) of Metal Bearing Wastes in FY 2012.				
10-12-01	Lead Contaminated Debris	161	Firing Range	17 kg (37 lb)
20-01-18	Spent Brulin Detergent	200	Clean Room	359 kg (791 lb)
20-02-46	Lead/Brass Contaminated Sample Debris	203	Metallurgy Lab	1 kg (2 lb)
20-04-99	Waste Metal Solutions	200	Chemistry Lab	30 kg (66 lb)

Table B-3 FY2012 WSTF HAZARDOUS WASTE GENERATION MATRIX

ON-SITE TREATMENT

CURRENT WIWPS	WASTE NAME	BUILDING	GENERATING AREA	ANNUAL QUANTITY
WASTE FUEL (P068, U133, U099) DILUTED AND TREATED IN EVAPORATION TANK				
20-04-03	Waste Fuel	200	Chemistry Lab	134 gal
20-04-102	Aqueous Contaminated Fuel Waste	200	Chemistry Lab	4.8 gal
INVESTIGATIVE DERIVED WASTE (F001, F002) TREATED IN EVAPORATION TANKS				
10-09-10 ,10-20-13, 10-20-30	Purged Groundwater, Decon Water, and Untreated Remediation Waste with IDW	All Areas	Environmental Department	25,998 gal
CORROSIVES (D002, P078) DILUTED/ADGASSED AND TREATED IN EVAPORATION TANKS				
20-01-13	Spent Oakite Ruststripper	200	Clean Room	93 gal
20-02-07	Development/Detergent Wash Water	203	Metallurgy Lab	17 gal
20-02-32	Spent Organic Etchants	203	Metallurgy Lab	3 gal
30-01-02	Decon Water w/Oxidizer	301	Propulsion Test (Shuttle)	65 gal
80-02-03	Oxidizer Decon Water	800	Hazardous Fluids Test Area	10 gal

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